higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

RIGGING THEORY N2

(11041852)

27 November 2023 (X-paper)
09:00–12:00

Drawing instruments and nonprogrammable calculators may be used.

This question paper consists of 6 pages and a formula sheet.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
RIGGING THEORY N2
TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. Read all the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Start each question on a new page.
5. Use only a black or blue pen.
6. Write neatly and legibly.

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QUESTION 1

1.1 Explain what precautions one would take against sheave wheel while a steel rope is mounted. (2)

1.2 Describe the construction of the Seale wire rope. (3)

1.3 Wire ropes in connection with scraper haulers or winches must have flexibility as well as good wearing qualities.

1.3.1 Name the type of core used in this construction. (1)

1.3.2 State TWO reasons for using this type of core. (2)

1.4 State FOUR reasons why a triangular construction wire rope is mostly suitable in drum winders. (4)

1.5 Define the following terms:

1.5.1 Ductility

1.5.2 Reserve strength

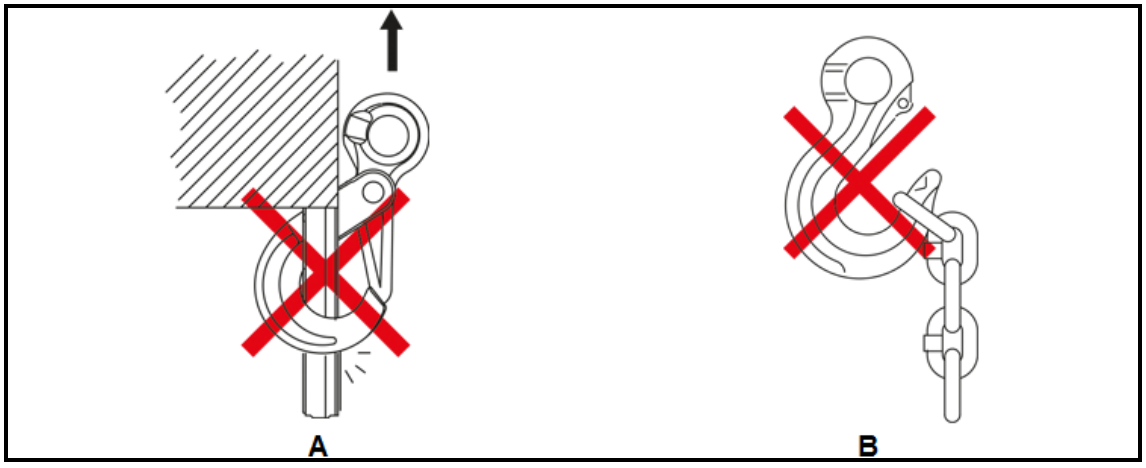
(2 × 2) (4)

1.6 State FOUR advantages of Af-grip mechanical splice. (4)

[20]

QUESTION 2

2.1 The FIGURES below show the incorrect way of attaching chain slings.



2.1.1 Explain why FIGURE A is incorrect. (3)

2.1.2 Explain why FIGURE B is incorrect. (2)

2.2 State the differences between the following jacks:

2.2.1 Screw jack

2.2.2 Hydraulic jack

2.2.3 Ratchet jack

(3 × 2) (6)

2.3 List FOUR ways of caring for chain slings during the storing process. (4)
[15]

QUESTION 3

3.1 Explain the purpose of haulage depressing rollers. (3)

3.2 Explain what causes surge wheel pluck in haulage ropes. (3)

3.3 List FOUR possible hazards that can damage haulage ropes. (4)
[10]

QUESTION 4

4.1 Explain how one would install a new elevator rope. (6)

4.2 List FOUR defects that can occur on cable drum winders. (4)

4.3 Explain where each of the following wire rope constructions may be used:

4.3.1 Seale

4.3.2 Non-spin construction.

(2 × 1) (2)

4.4 State THREE advantages of a Koepe hoist system. (3)
[15]

QUESTION 5

5.1 State TWO functions of safety detaching hooks. (4)

5.2 List FIVE defects that can be found on a detachable hook. (5)

5.3 List ONE purpose of a plate grab. (1)
[10]

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QUESTION 6

6.1 List THREE types of travelling cranes that operate on fixed tracks. (3)

6.2 Define the following terms applicable to mobile cranes:

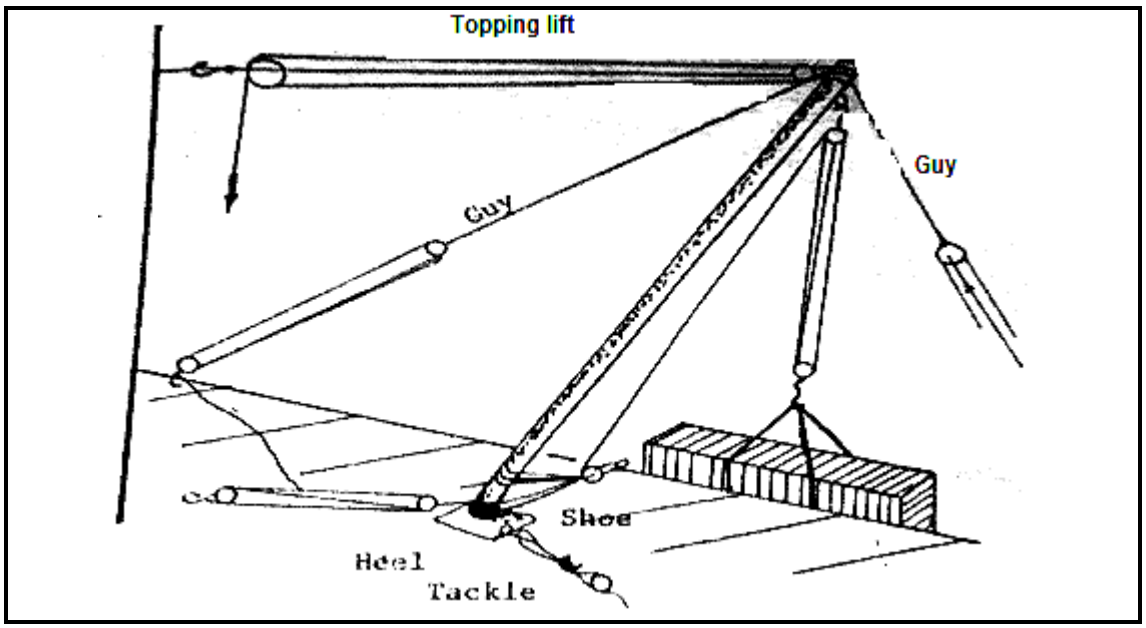
6.2.1 Hoisting

6.2.2 Jib centre distance

6.2.3 Outreach

(3 × 2) (6)

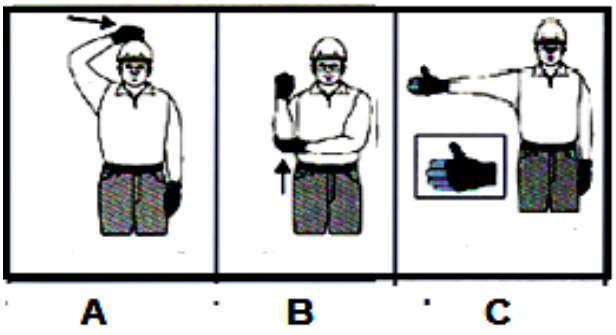
6.3 The FIGURE below shows a type of derrick anchor.



6.3.1 Name the type of derrick anchor. (1)

6.3.2 Explain the assembly process of the anchor shown in the FIGURE above. (4)

6.4 The DIAGRAM below shows different types of hand signals. Write only the name of each hand signal next to the letter (A–C) in the ANSWER BOOK.



(3 × 2) (6)

[20]

QUESTION 7

A cylindrical tank has a diameter of 1,8 metres. The depth of the water in the tank is 2,5 metres. Water is pumped from the tank until the depth of the water in the tank is 1,3 metres.

7.1 Calculate the volume of the water that has been pumped out. (Present the answer with TWO decimals.) (7)

7.2 Calculate the mass of the water that has been pumped out. Density of water is 900 kg/m. (Present the answer with TWO decimals.) (3)

[10]

TOTAL: 100

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(11041852)

FORMULA SHEET

Any applicable formula may also be used:

1. $A = \pi r^2$
2. $A = \frac{1}{2.} . b. h$
3. $A = \frac{1}{4} . \pi . d^2$
4. $A = L. L$
5.. $A = l . b$
6. $f = m. g$
7. $Cos\ \theta = \frac{Adjacent}{Hypotenuse}$
8. $Sin\ \theta = \frac{Opposite}{Hypotenuse}$
9. $Tan\ \theta = \frac{Opposite}{Adjacent}$
10. $V = l . b. h$
11. $V = \pi r^2 . h$
12. $V = A. h$
13. $Work\ done = force \times distance$
14. $Force = mass \times gravitational\ force$

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